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THE JOURNAL OF PHILOSOPHY

RIGNANO'S HYPOTHESIS OF A VITAL ENERGY AND THE PREREQUISITES OF A SOUND THEORY OF LIFE

IN his recent book, *Qu'est-ce que la vie*,[1] Rignano has developed a theory of the living organism which differs from any of the three traditional vitalistic, mechanistic, or teleological types of theory and which, nevertheless, is to a certain extent a combination of all of them.

His theory is vitalistic in the sense that he asserts the presence in living things of a strictly biological factor which is not present in the inorganic. It differs, however, from a vitalistic theory such as Driesch's because this biological factor is not imperceptible. Life is a form of energy, *sui generis*.

The theory is teleological to the extent that it rests upon and emphasizes the tendency to self-maintenance and restoration and reproduction, which is so characteristic of life, and also because it insists that there are characteristics in organic systems forcing one to judge them teleologically, which do not exist in inorganic processes. The theory develops by emphasizing the teleological characteristics of life rather than by tending to ignore them. It is not teleological, however, in the sense of introducing the end or final state as an essential cause. The teleological appearances exist and they do not reduce to the principles and entities of physics and chemistry, but their presence is due to the existence of a new type of energy possessed of the property of mnemonic accumulation. Given a universe of electrons and protons and this purely biological kind of energy, systems with the teleological characteristics exhibited by living things follow. The teleological attributes of life result, neither from any mysterious foresight nor from the entrance of a final cause, but from the properties of an energy which, since it gathers up the past, tends to maintain, preserve, and restore what that past has produced. Teleology results, not from the working of the future in the present, but from the accumulations of the past in the present. The mnemonic character of this energy makes a living

[1] *Qu'est-ce que la Vie? Nouveaux essais de synthèse biologique.* EUGENIO RIGNANO. (Bibliothèque de Philosophie contemporaine). Paris: Felix Alcan. 1926. 208 pp.

organism an "être historique": "historique, non dans le sens que son état actuel est simplement une conséquence de son passé (on peut en dire autant de tous les corps inorganiques), mais dans le sens que le passé, après avoir modelé cet organisme, après en avoir déterminé la forme, le comportement et toutes les activités physiologiques ou psychiques, continue à être actif également dans le présent, sous la forme précisément d'accumulations mnémoniques d'activités passées; si bien que l'organisme actuel reflète et reproduit en lui-même l'histoire du passé." [2]

The theory is non-mechanical in the sense that it denies the complete validity of the physico-chemical categories to account for life; it is mechanical, however, to the extent that it admits them as partial causes and is deterministic.

The argument to the theory rests upon the fact that living things exhibit essential characteristics which inorganic systems do not possess. These characteristics appear, not only in the higher forms, but in every stage of physiological development from the more simple processes of assimilation and metabolism to those complexities which involve the compounding of affective tendencies to produce the moral and legal elements in human society. There are certain dynamic, spontaneous, teleological characteristics of living things which inorganic systems do not exhibit. Therefore, Rignano argues, these characteristics prove or suggest the existence of an energy of an entirely different type from that present in the inorganic. Furthermore, given this energy and assuming a correlation between its manifestations in the objectively observable tendency to the maintenance of the normal physiological equilibrium and in the subjectively known psychical factors termed "desires," "needs," etc., it is possible to account for the psychical as well as the physical life of man. Its deductive fertility combines with the argument from the fact of the essential difference between the organic and the inorganic to justify Rignano in its acceptance.

The specific considerations which lead him to this conclusion merit attention. In assimilation and metabolism certain facts not present in the inorganic stand out. Organic material is the result of an active, not a passive process of synthesis, he says. In the crystal, organization occurs, but it is the result of a process in which the elements are passively deposited. In this connection Loeb is quoted. "Ce pouvoir synthétique de transformer de petites 'pierres de construction' en composés compliqués, spécifiques pour chaque organisme, constitute le 'secret de la vie' ou, plutôt, un des secrets de la vie." [3] Life "s'agit . . . d'un processus actif de synthèse et de reconstruction." [4]

[2] P. 165.
[3] P. 11.
[4] P. 10.

But this is not all. An organism, Rignano says, is a dynamic equilibrium which tends to maintain itself. Not only is it a complicated system produced by what seems to be an active process of selective synthesis, but this active process seems to function teleologically to preserve what it has produced. M. Piéron is quoted as saying: "Tout se passe dans la matière vivante, comme si la préservation d'un équilibre chimique instable constituait son but immanent." [5] Creative, selective, spontaneous activity seems to be combined with teleology in living things.

The most important point appears when Rignano attempts to show that the synthesis involved in the stability of living things can not be explained by the traditional physico-chemical principles. In this connection he puts his finger upon one of their significant peculiarities. They involve an unusual combination of stability and instability. Dissociation plays as important and essential a part as association in organic stability. Rignano uses this fact to prove the absurdity of the mechanical theory of assimilation. His argument may be stated as follows: a mechanical explanation accounts for a given phenomenon by tracing it back to previous factors; this is impossible with reference to organic synthesis, since the physico-chemical elements which are the immediately previous factors that must constitute the coördinative mechanism are in a state of dissociation and flux.

If one attempts to escape the difficulty by assuming a stable mechanism existing apart from the dissociating substances, then an absurdity arises, since the mechanism must be assumed to vary with the degree and chemical nature of the dissociation in the precise way necessary to produce the normal equilibrium. "En d'autres termes, il doit y avoir, entre le mécanisme synthétiseur et le processus de désintégration, le même rapport qui existe entre la médaille et le coin quit sert à la frapper: lorsque celui-ci change, la figure de la médaille subit un changement correspondant; de même avec le changement du processus de désintégration, doit changer aussi, et en parfaite correspondance, le mécanisme d'intégration." [6]

The physico-chemical fact at the basis of this argument has been emphasized by the English physiologist, J. S. Haldane. He has pointed out [7] that protoplasm, the fundamental substance in living things, is unstable. Instead of being the kind of physico-chemical material which can account for the stability of the system in which it appears, it depends upon the relations in which it stands for its own stability. Instead of looking to the physico-chemical

[5] P. 14.

[6] P. 12.

[7] *The New Physiology.* London, 1919, p. 35.

materials to explain life, it seems as if we must look to life or a positive creative teleological process of synthesis to account for the existence of the materials. The peculiar part which instability and dissociation play in living systems can not be ignored. It presents a problem which traditional mechanism needs to consider more seriously.

From these facts Rignano draws the following conclusion: "C'est ce que Loeb n'explique pas. Aussi l'idée qui se présente spontanément à l'esprit est-elle que la vie consiste *en un processus énergétique synthétiseur* qui englobe dans son tourbillon la substance qui nous appellons vivante et qui, lorsqu'il cesse, laisse cette dernière à la merci des seuls agents physico-chimiques naturels qui sont surtout de désintégration."[8] . . . It is quite clear upon Rignano's theory that if this vital energy were not present, the most simple organic systems would not exist.

The fact of chemical synthesis is but one element in his argument. Its more general basis is revealed in the following statement: "En présence de tous ces faits qui distinguent si nettement le phénomène de la vie, dans ses manifestations les plus générales et les plus élémentaires, de tous les phénomènes du monde inorganique naturel, lesquels ne présentent rien de semblable, il est permis de se demander, nous semble-t-il, s'il est vraiment conforme à l'esprit scientifique de s'obstiner à nier, contre l'évidence, que ces faits présentent quelque chose de substantiellement différent de la phénoménalité ordinaire purement physico-chimique, et de continuer en conséquence à prétendre que les seules lois physico-chimiques doivent suffire à les expliquer; ou, plutôt, s'il ne serait pas plus conforme à la saine méthode positive de chercher si, en formulant l'hypothèse d'une nouvelle forme d'énergie,—soumise par ailleurs et à tous égards aux lois générales de l'énergétique, mais douée de propriétés élémentaires bien définies, différentes de celles qui sont inhérentes aux diverses formes d'énergie du monde inorganique. . . ."[9]

When Rignano passes to a consideration of generation and regeneration, of adaptation to environment, and of the more complex and higher processes, both individual and social, the evidence accumulates to support this hypothesis. The argument, however, is the same as the one given above. The existence of harmonious development in morphology emphasized by Driesch, and the fact that the embryo develops as if it were guided or directed by an occult intelligence or entelechy much after the manner in which a technician constructs a machine is noted. The inadequacy of the theory

[8] P. 20.
[9] P. 22.

of chance variations to account for adaptation to environment, is emphasized. In this connection Rignano urges two points. First, there is no process of natural selection in the inorganic. Second, the Darwinian theory presupposes a positive tendency to persist which is characteristic only of the spontaneous and teleological consequences of a vital energy. A study of behavior in even the simplest forms confirms Rignano in the same conclusion. The trial and error mechanism and the capacity to react without external stimulation together with the presence of a positive tendency to maintain the animal "dans son optimum d'ambiance" imply the spontaneity and teleology of a strictly biological factor.

When Rignano considers the reflexes and the instincts, the psychical side of life appears. It is because, in the higher stages of development, the reflexes are so unequivocally adjusted to the maintenance of the normal physiological state that they have given rise, he says, to the conception of the organism as a machine. It is simply because the positive tendency to maintain the normal has become stereotyped in the reflex, that mechanism is plausible. But just as a machine which exhibits a fitness for a certain function implies its creator so the organism with its regular tendency to maintain the normal physiological state involves that which preserves the neutral materials as instruments for a certain end. It is only when one regards the reflex as "la fixation mnémonique graduelle de la tentative réussie, exécutée sous l'impulsion de la tendence affective correspondante" [10] that it becomes intelligible. The fundamental mnemonic character of both reflexes and instincts makes it necessary to study the affective tendencies for a complete understanding of the nature of life.

In this study the richer psychical content of the vital energy appears and a unified theory of the bodily and psychical life of man is traced out and developed. The theory rests upon the method of hypothesis and the introspective evidence for the connection between psychical and objective physical factors. In all forms of life there is a tendency to remain in a stationary physiological state or to return to it. "Si nous réservons la dénomination d' 'affectives' à cette catégorie spéciale de tendances organiques qui, subjectivement, chez l'homme, se manifestent comme 'besoins,' ou 'appétits,' ou 'désirs,' et, objectivement, chez l'homme et les animaux comme mouvements, complètement exécutés ou à l'état naissant, *pourvu qu'ils présentent un aspect non mécanisé*, il devient possible de ramener toute une sèrie de tendances affectives ainsi définies à une seule et unique tendance fondamentale, inhérente à n'importe quel organisme: tendance à l' 'invariance physiologique.' " [11]

[10] P. 105.

[11] Pp. 107 and 108.

The affective tendencies fall into three groups: those which exhibit themselves in instincts, as behavior which does not have to be learned; those involving Jennings' principle of "the readier resolution of physiological states," which arise "par voie d'habitude"; and finally those which are derived or compounded from the first two. A study of mental and social activity is made to demonstrate that the will, the emotions, the attention, and the reason, together with the moral and legal aspects of society, can be defined in terms of these two groups of fundamental affective tendencies. Since both of these groups are mnemonic in character and nothing more or less than the expression of the vital energy, Rignano is able to present his hypothesis as a theory of the psychical as well as the physical life of man.

There is a continuity of development evident in Rignano's theory which must commend it to anyone. The picture of the coordination of the physico-chemical materials to produce life with its spontaneity and capacity to learn and to preserve what has been learned, together with the correlation between the psychical and the biological which results in the final production of the rich cultural and social life of man provides a view of life which a general observation of man and his relation to nature and society seems to support. It must be admitted that the general picture involving the physical and the psychical and the combination of both to produce the rich spiritual life of man is very close to the truth. The general impression left by Rignano's theory is one which will commend it to many people. The fact that it appears to offer an escape from an unscientific vitalism or a teleological position which negates positive research will commend it to many more.

However, one must not allow the very satisfactory general picture of the union of the physical and the psychical to cause one to mistake a general description of the facts to be explained for a proof of the existence of the vital energy proposed as their explanation. The real question is not whether this general outline of the development of life is more or less true, but whether such a development justifies the thesis that life involves a vital energy with the peculiar property of mnemonic accumulation. There are two ways to answer this question. One is to assume his arguments against mechanism to be valid and to determine whether this energy has the capacity to produce the development which he has outlined. The other is to determine whether the facts to which he refers necessitate or give a reasonable basis for the acceptance of a strictly biological type of energy. We shall consider the theory from the deductive point of view first.

A query is in order with reference to the meaning and significance

of the psychical element in his theory. He says unequivocally that the "marque psychique" of all the phenomena of life is only "une marque mnémonique."[12] It is by maintaining this that he is able to give a causal and deterministic account of biological teleology and thus to escape the charge that his hypothesis discourages scientific research. Thus he says, "Les 'causes finalistes' sont scientifiquement inadmissibles, lorsqu'elles sont conçues comme un 'futur' qui évidemment, ne peut agir avant d'être. Mais dans le finalisme biologique ce n'est pas le *futur* qui agit, mais le passé, par les accumulations mnémoniques."[13] Again he says, "Nous n'avons pas d'avantage en besoin d'invoquer 'un principe interne, co-substantiel, guidant et coordonnant les actions particulières des diverses parties de l'organisme, en vue de la réalisation d'une fin.'"[14] The psychical side of life is not a cause, but an expression of the imprint of the vital energy with its fundamental property of mnemonic accumulation.

As expressed in the above quotations the theory is consistent. It must be noted, however, that it is utterly incapable of accounting for the facts which mechanism is supposed to leave unexplained. If this vital energy has no property other than that of being able to actively preserve the past, it follows that it can produce no effect which has not been produced before. It does not initiate new lines of activity, it merely preserves and repeats what has been initiated by other causes. This serves very well to account for learning, but it fails completely to account for the chemical synthesis involved in the chemical organization of life which makes an organic system possible.

In his first chapter Rignano goes to great pains to inform us that living things involve a type of chemical organization which the traditional principles of physics and chemistry are incapable of producing. Assuming this contention to be true, it means that the vital energy must begin with chemical elements, scattered here and there in nature, which are incapable of organizing themselves. If the new energy is to be competent to bring order out of the chemical chaos which the argument against mechanism has created, it must coordinate into stable organic systems physico-chemical materials which can not coördinate themselves when conditioned by the traditional principles. It is quite obvious that an energy possessed of no property other than that of actively preserving what the past has produced would be useless. Since the past would be constituted solely of inorganic systems or chemical flux, there would be nothing

[12] P. 163
[13] P. 161.
[14] P. 161.

to be accumulated but the systems and flux of the inorganic. Instead of accounting for the peculiar type of chemical organization present in living things such a factor would merely preserve the systems and the flux of the inorganic.

We have come upon the fatal weakness of all arguments to vitalism. They prove too much. There is no point in introducing these additional purely biological causes unless organisms would be impossible without them, but if such is the case, then the organization necessary for the effectiveness of an entelechy or a vital energy possessed of mnemonic properties does not exist. The problem of biology is the problem of organization and the problem of organization is the problem of accounting for the origin and stability of a peculiar type of physico-chemical relatedness. If the traditional principles of physics and chemistry can account for this organization, entelechy or a vital energy is unnecessary, and if the traditional principles are inadequate then these biological or psychological factors are useless. Without the physico-chemical materials organized to give the vital energy an established type of organization to preserve by means of its property of mnemonic accumulation, the energy is worthless, and with the organization it is unnecessary.

It is only because the vitalists of either the physical or the metaphysical type fail to take their arguments against the mechanists seriously that their theories of an entelechy or a vital energy become plausible. If the arguments against the mechanists which make the introduction of these new entities or factors necessary are sound, the laws of physics and chemistry must be conceived of as leaving the chemical elements, involved in life, scattered throughout nature in a state of flux. In such a situation an energy possessed of nothing more than the property of mnemonic accumulation would be as helpless and incompetent a source of organization as a cork in a hurricane in a boundless ocean. If mechanism is inadequate it must be realized that the materials are not at hand to provide the organization which a vital energy is to "remember" or to provide the possible chemical reactions which entelechy is to suspend. Instead, entelechy and this vital energy must go out into a chaos of trillions and trillions of molecules which can not organize themselves into organic groups and select one here and another there and bring them together into a certain place to build up a system which is stable. The properties which these vital factors possess immediately eliminate them as adequate for such a task. The problem of organization is the problem of explaining how unstable chemical materials and a peculiar combination of chemical association and dissociation

join together to form a physico-chemical equilibrium which persists for a certain length of time. To propose a solution by the introduction of entelechies or units of vital energy is but to uselessly complicate a situation in which there are too many entities and in which there is too much energy already. The occasion calls neither for entities nor for energy, but for some coordinating principle which can supplement the traditional principles of physical science to get the simplest type of organism into existence.

One other difficulty arises concerning the adequacy of an energy with a purely mnemonic quality. Rignano, in deducing the elements of the psychical life from this fundamental factor, included desires, appetites, and the will. In speaking of chemical synthesis he also speaks of choice. If desire or choice has as its reference the mere maintenance of that which has already been realized this exposition is consistent, but if either refers to the production of something not yet attained, then the present is conditioned by an ideal to be realized in the future and not solely by what has been accumulated from the past. He is unable to keep away from the latter alternative, for he says, "Il n'existe donc aucune séparation entre les agents qui dirigent les phénomènes et les phénomènes qui sont guidés, agents dirigeants et phénomènes guidés étant une seule et même chose: *accumulations mnémoniques en cours d'activation.*"[15] "C'est précisément l'accumulation mnémonique qui porte la fin en elle-même, c'est-à-dire qui porte à l'état potentiel telles ou telles activités physiologiques, à l'activation des-quelles par conséquent elle tend et dont l'activation constitute précisément la fin en question."[16] The last sentence means that this vital energy is not merely something which accumulates what the past has realized but that it possesses from the outset, within itself, everything that can ever become past. In other words, it possesses the ideal activity and form which is not yet realized. This is essential if it is to play the part ascribed to it in the origin of new species or if it is to escape being the useless thing described above. But if this is admitted the vicious teleology which he condemns is present. Phenomena are conditioned not only by purely observable physical factors existing in the present, but also by an imminent potentiality which will only be realized in the future. This is the final cause of Aristotle, no matter how much reference to it as connected with energy may disguise the fact. As such, it is subject to the criticism which its author launches against final causes. The vicious type of teleology which Rignano tries to avoid is possible providing he limits the vital energy to a purely

[15] P. 164.

[16] P. 164.

mnemonic property. The difficulty, however, is that such a type of energy is useless to solve the problem which is raised. Only by regarding the energy as containing within itself the principle which it preserves does the theory become even slightly plausible.

If something other than mechanism is necessary it is a coordinating principle and not additional entities or energy. As Aristotle clearly perceived, a coordinating principle, or as he termed it, form, is meaningless as a thing in itself. It thus becomes necessary to regard both matter and form as characteristics of an irreducible process of development. This is the only meaning that can be found for a relatedness independent of the entities which are related. It is important to note that such a thesis has two consequences. One is the acceptance of teleology, the other the denial of the primacy of the physical chemical categories even as partial fundamental causes. They become merely more or less permanent characteristics of a process of change, owing their apparent individuality to an act of the observer when he tears them from the process to turn them into entities of thought. To assert that activity or process rather than stuff is fundamental is to maintain the principle of becoming. This principle means that time introduces something new. From this it follows that a given phenomenon is not wholly conditioned by past factors and hence that teleology is inescapable. If one agrees with Rignano in the contention that teleology is vicious there seems to be no other alternative but to examine more thoroughly the capacity of mechanism to account for the peculiar type of organic relatedness which the traditional principles seem to leave inexplicable.

What are the merits of the theory of a vital energy when considered from the inductive point of view? The three most significant facts which constitute the argument to the theory are the psychical characteristics of living things, their dynamic characteristics, and their teleological tendency to maintain the normal physiological state.

In the higher forms of life the psychical aspect is an evident fact. However, this fact can not constitute a proof of the existence of a purely biological type of energy. The psychical may be the property of a mind entirely separate from matter and energy or a correlate of the matter of the inorganic. It is to be noted that materialism implies the existence of the psychical, for it can only make its case against Aristotelianism in the face of the obvious facts of colors and sounds which are in nature, by presupposing a mind to take care of these factors which its physical categories ignore. A truly scientific materialistic physics and a thoroughgoing behavior-

istic psychology are incompatible. The psychical attributes of man prove nothing, therefore, concerning the existence of a vital energy.

The spontaneity exhibited by living things also constitutes a most questionable basis for an argument to such a factor. Rignano says: "Les tendances des corps inorganiques sont dues à des forces qui leur sont extérieures et qu'ils subissent; les tendances affectives des animaux, au contraire, sont dues à des forces internes, indépendantes des forces extérieures et autonomes à l'égard de celles-ci.[17]

"De là découle l'aspect d'activité et de spontanéité dans le comportement des êtres vivants, en opposition absolue avec l'aspect de *passivité* et d'inertie qui caractérise la matière brute.[18] If, instead of considering vital energy in contrast with brute matter, we are fair to materialism and make the comparison with inorganic energy, the argument that the inorganic categories are incapable of accounting for organic spontaneity becomes a bit fantastic. For energy is that which does work. It certainly is difficult, even in the realm of the anthropomorphic, to find anything any more inherently creative and spontaneous and dynamic. One might add that it is not an unknown attribute of certain organic systems, some of which are not the lowest in the paleontological scale, to exhibit a certain passivity with reference to the exhibition of this property which is the very essence of inorganic energy. It must be admitted that it is very difficult to conceive of anything more dynamic and independent of external causation than inorganic energy. If spontaneity is all that is required there seems to be no reason why the ordinary energy of inorganic science will not do.

Not only is the ordinary energy of physical science capable of accounting for the dynamic characteristics of living things, but it provides the only exact account of why there is less of the spontaneous in the inorganic. In the eighteenth century Lavosier noted that the organism is tied into the inorganic universe. He noted not only that there is an exchange between plants and animals of oxygen and carbon dioxide, but also that all organisms stand in an essential relation to the solar system. Living things depend upon energy from the sun for their own origin and existence. Stated in thermodynamical terms this means that they require work to be done upon them in order to exist. This is undoubtedly one of the most fundamental characteristics distinguishing organic from inorganic systems. The latter combine spontaneously, often releasing energy in the process; the former require energy to be put into them in order to be produced. I am indebted to Professor F. H. Pike of the Department of Physiology of Columbia University for impressing the

[17] P. 115.

[18] P. 115.

significance of this fact upon my mind and also for pointing out that the fallacy involved in regarding life as a special form of energy was noted as early as 1870 by Wyeville Thomson in his Edinburgh address. It is quite obvious that systems which give up energy when they are formed should be less spontaneous than those which gain energy in their formation. When we combine with this the fact noted by Rignano in his discussion of assimilation and metabolism, that an organic system involves chemical decomposition as well as chemical combination and that this dissociation results in the breaking down of organic compounds to release the energy contained in them, it becomes obvious that no special kind of energy is required to account for the spontaneity and "internal causation" exhibited in living things.

Nor is the situation different if we view the fact of spontaneity from the point of view of matter rather than energy. Mechanism can stand up before the two facts of stuff or conservation and change only by accepting the atomic theory. It is an entirely false conception of the ultimate physico-chemical entities which regards them as inert and subject only to external causation.

There is no point whatever in physical mechanism and its atomic theory unless it accounts for change. It can not do this unless the atoms are conceived to be in constant motion. Since the void is impotent and there is nothing aside from the atoms except the void, it follows that the source of their motion must be internal and not external. The motion of the atom is as spontaneous and completely conditioned by internal causation as the behavior of the most peppery fighting cock one can imagine.

If we, knowing the fundamental principles of the atomic theory, were to come into this universe for the first time without the present habit of thought which takes the passivity of the inorganic for granted, there is little doubt but that the question we would ask would not be why organisms are so spontaneous, but why inorganic systems succeed so thoroughly in masking the spontaneity of the elements out of which they are constructed.

It is a peculiar mental intoxication which causes certain individuals upon the observation of spontaneity in living things or upon the mere pronouncement of the phrase, "the dynamic atom," to solemnly read the obituary notice of materialism. Why the combination of moving electrons and protons to form a chemical element should not produce a system, the parts of which are moving, and why at least certain molar systems should not exhibit the dynamic characteristics of the basic elements which constitute all systems, seems difficult to understand. If a special kind of energy is required to account for the differences between living and non-living

things, it would seem that its task should be to mask the appearance of spontaneity in the inorganic rather than to produce it in the organic.

In emphasizing the presence in the organism of an appearance of teleology which is absent for the most part in the inorganic realm, the argument for a strictly biological factor rests upon more solid ground. Yet here also a word of warning must be uttered. The experimental work which has revealed this appearance of teleology has also indicated that in many cases, at least, it can not be taken at its face value. What appears as such turns out often upon closer examination to be the reverse. There is, for example, the classical case reported by Jennings [19] of bacteria originally distributed evenly in a field of water into which at a certain place a drop of oxygen is introduced. If we look at them again after a time they are all found collected within the drop. What could be more teleological? They need oxygen for the maintenance of the normal physiological processes and they go into the drop to get it. Suppose, however, that instead of being content with an observation of the first and last state, we examine the intermediary stages of their behavior. Jennings tells us that they swim about at random. As a result, their paths take them sooner or later into the drop. They do not stop, however upon arriving there. Instead they proceed directly through to the other side, where, upon entering the region devoid of oxygen, they reverse their course and proceed back to the opposite side to repeat this procedure.

It is as if a man came into a room in need of a match to light his pipe and finally arrived at the holder upon the mantel when a procedure of rectilinear motion and deflection, analogous to that of the billiard ball with reference to the sides of the billiard table, finally took him around the room again and again until he bumped his nose into the match case. We would scarcely brand such behavior as teleological.

An example quoted from Rhumbler by Bayliss in his *Principles of General Physiology* is also quite to the point. "If a fine bit of glass rod be pushed against a drop of chloroform under water, it can not be made to enter the drop; on releasing the pressure it is immediately rejected. If, on the contrary, the rod be first coated with shellac it is at once sucked in. As soon as the shellac is dissolved by the chloroform the rod is thrown out again. . . . One might say that the chloroform will have nothing to do with substances that it can not digest, and when a mixed food particle is presented to it and accepted, it digests a part and rejects a non-assimilable remainder." [20] Certainly one must insist that this appearance of

[19] *The Behavior of Lower Organisms*, p. 29.

[20] P. 3. (London, 1915.)

teleology reduces to physico-chemical causes. Something more than an appearance of teleology is necessary, therefore, to warrant the assertion that categories other than the physico-chemical exist.

Yet any adequate theory of life must indicate why the appearance is present so often in the organic and so rarely in the inorganic. This does not mean, however, that one is to argue directly to the existence of a vital energy. Such an argument is fallacious because adjectival differences do not necessarily involve substantial ones. An adequate treatment of this problem involves a study of the peculiar type of physico-chemical organization present in an organism, in its relation to the fundamental principles which condition the movement of matter and energy in space and time. We must first observe and agree upon the essential characteristics peculiar to the type of chemical organization present in a living thing and then determine whether the traditional principles are capable of moving matter and energy about to produce such an organization before we can decide whether the teleological appearances necessitate categories other than the physico-chemical.

This analysis has gone far enough in the work of L. J. Henderson [21] to indicate that if the adaptation and teleology apparent in life involve something more than the traditional principles, a purely biological or psychological category such as entelechy or a vital energy is wholly inadequate as the missing factor. His work shows that there is a fitness of the environment for life as well as an adaptation of life to the environment and that this fitness has its basis not in any interaction which occurred after life originated, but in the properties of the chemical elements which were determined at the time of the formation of the inorganic universe.

This means that the adaptations and fitness and teleology, so evident in living things, have their basis in the very foundations of the inorganic. Life is not an after-thought produced by the mysterious appearance of a vital energy after the inorganic universe was formed. It is grounded in no special private category, but in the fundamental principles which condition everything. Provision was made for it when the properties of the chemical elements were determined. It is because the adaptation and teleology to which Rignano points is not strictly biological in its basis, but has its origin in the fundamental principles of the inorganic, that a purely biological category is inadequate to account for it, if some new principle is necessary. The dynamic and teleological characteristics of living things and their many adaptations point to something very much more fundamental than a vital energy.

The factors which reveal the inadequacy of the hypothesis of a

[21] *The Fitness of the Environment*, 1913. New York.

vital energy also indicate the direction in which an adequate theory of life is to be found. For one thing, we must look to the fundamental principles which move matter and energy about in space to produce atomic, molecular, and molar systems. The first and most important task is to determine precisely what are the fundamental characteristics of an organic system. This brings us to one fundamental fallacy in all discussions of this problem. We have argued directly from isolated selected characteristics as if all physico-chemical systems were and must be like inorganic physico-chemical systems. Then, when we find that there are characteristics in an organism which do not exist in a stone, we conclude that there is a vital energy or an entelechy or a teleological principle in one which is not in the other. It does not seem to have occurred to any except a few rare thoughtful physiologists, who have never developed their philosophy, that the difference between the two systems may be due to the fact that the fundamental principles of physical science have organized the physico-chemical materials in a different way in an organism from what they are in a stone— and hence that it is folly to discuss the characteristics of living things without making a study of the peculiar type of physico-chemical organization upon which those characteristics depend.

There is nothing in connection with the theory of the organism which needs to be more emphasized than the fact that the first requirement of a sound theory is a clear conception of the peculiar type of physico-chemical organization which a living organism involves. Just as the general physico-chemical architecture of a whirlpool or a crystal is different from that of a stone, so an organic system is different from any of them. Put a stone in a vacuum and it still remains a stone. Its relation to its environment is relatively unimportant. Shut off the oxygen supply in this room for even a few moments and we cease to be living organisms. The elements outside of an organism are as essential a part of a living thing as the materials which, because they are solids or semi-solids, we crudely speak of as its body. The air we breathe is as much a part of an organism as the materials of its bones. To build a theory of the organism without noting these facts and going on to determine exactly what the general characteristics of this peculiar equilibrium between internal and external elements are, is to attempt to arrive at a theory of an organism without having even the most elementary conception of what an organism is. We have noted this same fact in connection with energy. Its relation to an inorganic system is entirely different from its relation to an organic one. Rignano in his first chapter puts his finger upon another fundamental differentiating characteristic. There is a peculiar combination of

association and dissociation in a living thing. Chemical instability plays as great a part as chemical stability in life. Any sound theory of the organism must begin, as Rignano begins, with the differences between the organic and the inorganic, but instead of assuming that the problem ends there, with the simple statement that a something exists as the condition of these unique characteristics, we must realize that the problem is in its most elementary stages.

The differences are signs of a different type of organization. We can not determine whether they involve principles other than those of the inorganic until we carry on a careful analysis and observation of the organization of the animal as a whole in its relation to the energy and elements of its environment to determine what the nature of this organization is. Once the essential observable and verifiable characteristics of an organism are known it is a simple problem in formal logic to determine whether or not life is conditioned by the traditional physico-chemical principles. One has merely to determine whether the propositions which describe the essential characteristics of this new type of system can be deduced from the first principles of traditional inorganic science. When we have a sound objective picture of the peculiar type of organization involved in a living organism, the theory will take care of itself. The occasion calls for the imagination to conceive of a type of physico-chemical organization different from that present in the inorganic, and for some practical means of getting a representative organic system before us as a whole and yet sufficiently analyzed into its significant elements, that we can perceive its essential characteristics.

"Life seems," as Wyeville Thomson said, "to be more a property of matter in a certain state of combination than a force." [22] With a careful determination of the peculiar and essential characteristics of this "state of combination," any adequate theory of the organism must begin.

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BOOK REVIEWS

Psychologies of 1925. Powell Lectures in Psychological Theory at Clark University. MADISON BENTLEY, KNIGHT DUNLAP, WALTER S. HUNTER, KURT KOFFKA, WOLFGANG KÖHLER, MORTON PRINCE, WILLIAM MCDOUGALL, JOHN B. WATSON, AND ROBERT S. WOODWORTH. Worcester: Clark University. 1926. Pp. 412.

This book contains an interesting collection of lectures by able persons representing various aspects of systematic psychology. The

[22] *Nature*, Vol. IV, p. 76.

entire field from militant behaviorism to the unconscious is passed hastily in review and one is left with a discouraging impression of the unwieldy extent of the subject-matter that is massed together under the name of psychology.

In no other branch of modern science can one imagine a book with a similar title. Such titles as "Physics of 1925" or "Physiologies of 1925" would, indeed, sound strange. One is somewhat reminded, in reading these lectures, of the accounts of seventeenth-century meetings of the Royal Society at which everything from celestial mechanics to the "spontaneous generation" of organisms and "Nature's abhorence of a vacuum" were discussed in the name of Natural Philosophy. While *Psychologies of 1925* serves to emphasize the dispersion of the materials of the subject, it nevertheless presents much that is stimulating.

The book begins with three lectures by John B. Watson on certain aspects of behaviorism. In these lectures Dr. Watson summarizes some of his valuable experimental work with infants. This work has consisted, in the main, of a study of the overt motor functions and instinctive behavior equipment of children from birth to four or five years of age. Watson also outlines some of his work on the conditioning and unconditioning of emotional responses in children. These summaries are interesting, although one may not agree with the sweeping and rather dogmatic conclusions which are drawn from the, as yet, meager experimental data.

The systematic setting of behaviorism is best presented in a lecture by Professor Walter S. Hunter. He calls his type of behaviorism "anthroponomy" and presents it in relief against a background of traditional Wundtian structuralism.

The *Gestalt* school is represented by Kurt Koffka and Wolfgang Köhler. Professor Koffka deals with the subject of mental development from the point of view of the *Gestalt* school; and Professor Köhler considers certain aspects of his work on the intelligence of apes with special reference to the solution of configurational problems involving "insight" on the part of the animals. In his second lecture Köhler discusses some of the problems of perception with which from its inception the *Gestalt* school has been concerned. He stresses the important liaison between introspectional configurationism and physiology and the possibility of using psychological methods as an index of underlying physiological processes. One feels in reading this that it is probably a presentation of the introspective method at its best. Köhler also discusses the position of analysis in psychology, a matter of much theoretical interest to those concerned with the problem of psychological atomism. He points out the artificiality of reïfying sensations or their attributes

and urges that the so-called sensory "elements" of consciousness be looked upon as logical constructions analogous in psychology to the concept of the mathematical differential as applied to physics.

Psychologies called purposive are championed by Morton Prince and William McDougall. Dr. Prince presents a series of objections to behaviorism as a substitute for psychology. He deprecates the tendency of some workers to eliminate mind as a subject for scientific investigation and the accompanying tendency on the part of these persons to relegate consciousness to the limbo prepared for it by Huxley in his famous parallelistic analogy of the "steam whistle and engine." He further emphasizes the inadequacy of even the best physiological technique at the present time for dealing with most of the pressing problems of human conduct; and he urges the necessity of a methodology not limited by the confines of pure objectivism. Dr. Prince emphasizes the fundamental differences between mental processes, *per se*, and the objective correlates of these processes, and he stresses the importance of studying these double aspects of experience by way of both the introspective and behavioristic methods. However, Dr. Prince concludes his lecture by proposing an ultimate monistic identification between these two aspects of experience. He does this by the use of certain analogies and general concepts drawn from the realm of modern physics.

In his second lecture Dr. Prince develops a biological theory of consciousness. His approach is interesting, but of a highly speculative nature, especially regarding inferences which are drawn concerning "animal consciousness." The discussion contains analyses of conceptions of consciousness from both the "structural" and functional point of view. In his last lecture Dr. Prince deals with certain problems of personality from the standpoint of his wide clinical experience in the field of abnormal psychology.

Discussions by Professor McDougall summarize the position of purposive psychology in the light of its historical setting. He presents criticisms of the various systematic divisions of the behavioristic school and suggests the possible enlargement of purposive concepts in experimental psychology. This is of interest since purpose inevitably seems to be a most baffling and embarrassing element in the laboratory. McDougall's position is essentially a plea for the utilization of all of the available data of psychology and a warning against systematic and metaphysical limitations of relevant observation.

The Wundtian tradition, or what now remains of it, is represented by Madison Bentley, who gives a historical résumé of "structuralism." Since "structuralism" represents an experimental movement that has been perhaps the most clearly defined and influential

in modern psychology, Professor Bentley's contribution is important. In his last lecture he develops a general picture of what he calls the psychological organism or "psychosome," and discusses various lines of approach to a more complete knowledge of it.

There is also a lecture by Professor R. S. Woodworth on "dynamic" psychology and three lectures by Professor Knight Dunlap on what has been termed "reaction" psychology. These lectures cover a wide range of material but do not present anything new of a systematic nature. One of Dunlap's lectures, "The Experimental Methods of Psychology," is a valuable short review of that very complicated subject-matter.

HUDSON HOAGLAND.

CAMBRIDGE, MASS.

General Principles of Human Reflexology. V. M. BEKHTEREV. 3d edition, revised and supplemented. Leningrad: Gov't Publication. 1926. Pp. 423.

This is the third edition of a book, the first edition of which appeared in 1917, and the second in 1923. The author adheres in the main to the same principles of psychological objectivism which he has laid down in his earlier writings, *Objective Psychology, Collective Reflexology,* and in numerous smaller publications. New researches in the associated (conditioned) reflex from the author's and Pavlov's laboratories enable the author, however, to corroborate his original views and to extend them to a much larger degree. The various properties of associated reflexes, the manner of their establishment, internal and external inhibition, inhibition of inhibition, irradiation, time, and quantitative relationships are used freely as explanatory principles for all manifestations of human behavior. The existence of unique conscious data is not denied, but attempts are made to suck them under—to use Watson's expression. "Thought and, in general, subjective experiences are to be understood as inhibited reflexes which will, sooner or later, pass into the objective world in the form of a report or any other reaction."

Unlike most American behaviorists, Bekhterev is not loath to plunge into a lengthy discussion of the body-mind problem. He frankly declares himself to be a gnoseological materialist. "We have to recognize one fundamental and primordial basis of everything existent which we designate by the name of energy." "We shall content ourselves with defining energy as motion, and will not enter into a further analysis of the problem." "Matter as well as the metaphysician's 'thing-in-itself' are nothing more than bound

energy." "Psychical processes are a result of a greater tension of that same energy, this greater tension usually occurring when a nervous process is inhibited." "There is one neuro-psychical process from the beginning to the end, but with the insignificant resistance in the peripheral apparatus, the process does not manifest itself in a subjective form, while in the central regions, as a result of the greater resistance, the same process gets a distinct subjective tinge." It may be seen that this attempt to identify consciousness with inhibition is different from that of Professor Montague. It is not anergy, or potential energy, but actual kinetic energy under tension which causes subjective experience. Telepathic phenomena, the authenticity of which, the author asserts, was confirmed by his laboratory studies, are explained by the same principles. "The brain of man and of animals, being an energy accumulator, may also under certain conditions play the rôle of an energy transmitter or receiver, similar to a radio station where Hertzian rays are utilized." One recalls the recent report of Dr. Ladd-Franklin that "the nerve when excited and probably also when unexcited emits physical light."

Human and animal activities are divided into: simple reflexes, organic reflexes (endogenous, internal reflexes, needs, instincts), and associated reflexes. The basis of the division is mainly the ease of their inhibition or modifiability. Particular attention is given to the concentration reflex, subjectivist's attention, which is considered to be no more than the physiological fact that "when one center is in a state of activity, excitations of other centers are inhibited, sometimes only reënforcing the active center." This physiological fact is merely due to the mutual relationship between excitation and inhibition, numerous counterparts of which are found in that storehouse of explanatory principles—the associated reflex. In general the author's zeal to apply the same explanations to physical and psychical phenomena often overshoots the mark. Thus, general principles, seventeen in number, supposedly holding true for the inorganic, organic, and supraorganic worlds, are formulated—and there analogy is used with little restraint. The fact that an associated reflex sometimes becomes firmly established after a number of futile trials is placed alongside with mutation in evolution, and the relation of acceleration to force with that of the conditioned to the unconditioned reflex. The book on the whole represents well the prevalent views of Russian psychological thought, as may be learned from the 1924 Congress of Russian Psychologists and Neurologists. It has a bibliography of the author's publications, 135 in number, and abounds with recent experimental data. It is only to be regretted that the author does not cite the experiments of his laboratory more fully; this would be very helpful to readers outside

Russia, where the doctors' dissertations in which the original experiments appeared are hardly obtainable.

H. S. RAZRAN.

NEW YORK CITY.

Le "De Ente et Essentia" de S. Thomas d'Aquin. M.-D. ROLAND-GOSSELIN, O. P. (*Bibliothèque Thomiste, Vol. VIII.*) Belgium: Le Saulchoir (Kain). Pp. xxx + 221.

St. Thomas's *De Ente et Essentia* is a short treatise addressed to his pupils on the subject indicated in its title. As its editor points out in his valuable introduction, St. Thomas seeks to define existence and essence and to indicate what the essence of the various kinds of beings is. The beings which particularly interested him are men, angels, and God.

The treatise is of especial interest to historians of philosophy since it marks in a way the Thomistic return to Aristotle. This is brought out in the attempted proof that Man's essence can not be either soul alone—as the Averroists and Neo-Platonists tended to assert—nor matter alone. On the contrary, it was the union of body and soul. But if this is true, then what is the essence of any particular man? Matter, as everyone knows, was believed to be that which individuated, not Aristotelian matter, the correlative of form, but *materia signata,* which is matter in given spatial dimensions. St. Thomas, if I read him right and I am open to correction, read into dimensions, *i.e.,* that which designated matter, spatial position. Since position is unique, it could easily become an individuating property.

One sees in this part of the little treatise how Christian dogma changed the direction of philosophy. The problem for St. Thomas was to make the soul and body of Christianity fit in with the soul and body of Aristotle. The great difficulty was that Aristotle's were not separable except for purposes of conversation, whereas the Christian had to be for many other reasons. In fact the life of the human being is largely a decorporealized life in Christianity, whereas in Aristotle it was only so at rare moments and even then only metaphorically. Naturally, then, St. Thomas had to ask the question, "What is the matter of the soul? Does the soul after death have matter?" Such questions could never have been raised by Aristotle, for he believed simply enough that the soul's matter was the body.

Thus his soul needed no other individuation than being the purpose of a particular body. St. Thomas's, on the other hand, had a peculiar destiny which made such a solution inacceptable. Some

day it was going to leave the body. What would its individuality be then?

His answer is rather interesting. The soul begins its career by corporeal individuation. But once individuated, it stays individuated even when it has no body. Individuation is a kind of effect which lingers on after its cause has ceased to be. In fact even when in the body it operates—in thinking—independently of it.

But what of the angels? They did not even begin their lives attached to an individuating body. They are absolutely immaterial. They are pure forms—surely a notion more Platonic than Aristotelian—and differ from one another as one species from another. Each is a class of one member. Nor did St. Thomas distinguish the member from the class. Historically this, I should imagine, goes back to the theory suggested by Plotinus, that there are ideas of individuals, a suggestion which Porphyry seems to have dropped. It is a curious *lacuna* in Father Roland-Gosselin's essays that he gives Plotinus practically no consideration as an influence on Scholastic thought and, indeed, is as slighting of Plato, in whose *Timæus* is a much closer analogy to the Thomistic theory of the principle of individuation than in Aristotle.

The distinction between essence and existence, which is on the whole the main burden of his treatise, was made in the interest of proving that the angels were inferior to God in that they were not simple but composite. If essence and existence were not distinct, then the angels—since they are pure forms without matter—would have been of a divine simplicity. But that would have been intolerable. St. Thomas's discussion of the problem is too compact to be summarized profitably here and is, moreover, analyzed in great detail by the editor.

As interesting as the text of *De Ente et Essentia* are the two series of essays which conclude the volume. One shows the development of the theory of the principle of individuation, the other that of the distinction between essence and existence. The historian of ideas will find these of unusual value since they are copiously illustrated with texts which are not always easily accessible and supported by notes. One regrets that the editor gives the appearance of anti-platonism, for more than once the *Enneades* and the *Timæus* come to one's mind as these well-documented pages are read. Picavet's theory of the importance of Plotinus in medieval thought has never gained the credence which the present reviewer is inclined to think it deserves. Certainly the general tenor of Christian theological philosophy is Plotinian rather than Aristotelian and even in this treatise in which, as we have said, St. Thomas goes back to Aristotle for one of his main tenets, one finds many a

point which would have been almost meaningless to the Stagirite. Pure forms, hypostases, the hierarchy of beings, what are these if not Plotinian conceptions? The matter-of-fact author of the *Metaphysics* could have made little room for them in his thinking and it seems too bad that their true source for one reason or another must not be acknowledged. For, after all, is Aristotle more orthodox than the other Pagans?

GEORGE BOAS.

THE JOHNS HOPKINS UNIVERSITY.

Spirito e Realtà, studio di filosofia come positivismo spiritualistico assoluto. Parte Prima. GALLO GALLI. Milano-Roma-Napoli: Società Editrice Dante Alighieri, Albrighi, Segati e C. 1927. Pp. 245.

This is another of those volumes of philosophy which begin with an analysis of perception and do not end until art, science, law, religion, and philosophy itself are redefined in analogous terms. The first part alone is here presented.

Like many Italians Signor Gallo Galli is impressed with the relation of reciprocal dependence. Sensation and thought, object and subject, appetite and will, are all in this situation. One could not exist without the other. Thus in the familiar terms of the Schellingian dialectic, what would an object be if there were not a subject or a subject without an object? How could we will anything which we did not desire or desire that which we could not will? The terms can be easily made to seem correlative, and since the terms are, maybe that for which they stand is also. But there are no "maybe's" in *Spirito e Realtà*. The philosophic method here utilized permits of nothing short of absolute certainty.

One would, however, imagine that having demonstrated the reciprocal dependence of two entities, one would conclude that each was as important as the other in the cosmic scheme. In a fashion Signor Gallo Galli does, for he asserts that the two are abstracted from a whole which is the act of knowing. In reality this act is a process ever moving on and to see the elements in it is to falsify it. Moreover, he insists that he is neither subjectivistic nor objectivistic. Yet when one reads along one discovers that the act in question is the act of knowledge and if it be not called subjectivistic, its name has subjectivistic connotations. For it is a spiritual act. Now how does a spiritual act differ from any other kind of process? By its fusion of opposites? But it will be seen that the only process which Signor Gallo Galli is willing to call "active" are such processes as knowing, willing, thinking, and the like. The subjectivistic tinge becomes obvious. Is it merely verbal? One doubts it

reading such phrases as, "La sensazione è affermazione autonoma della vita spirituale."

However, we may be unjust to this closely written and always eloquent book. One is perhaps wrong to criticize the writings of the present-day Italians from the point of view of logic. Their works, like Fichte's, are poems. They give you a picture of something very moving called "spirituality," which creates out of itself all that we know and all that we can hope to know. One learns nothing precise in studying such writings, but one has a strong emotional experience. As the present reviewer has remarked in this JOURNAL on other occasions, when reviewing the works of Signor Gallo Galli's masters and *confrères,* it is an excellent philosophy for the Italy of to-day. That it should be shared by so many people is the only thing which amazes one. For, after all, there must be some people in Italy who have a desire for evidence. Or has the whole country become lyrical?

GEORGE BOAS.

THE JOHNS HOPKINS UNIVERSITY.

The Self and Its World. GEORGE ARTHUR WILSON. New York: The Macmillan Company. 1926. Pp. vii + 383.

Although not definitely stated, I take it that this work is primarily intended for students and those not specialized in philosophical subjects. In this "age when everything that has been thought settled is under fire," it is proposed to reëxamine our profoundest convictions and in the light of present-day knowledge endeavor to set forth a philosophy which is most adequate for the resolution of our difficulties. The doctrine which best fulfills this function is discovered in that form of idealism which, tracing its origin to the Kantian and neo-Kantian movement, incorporating the modifications of the school of Bradley, Bosanquet, and Royce, assumes its final development among recent writers in the theory known as personalism.

The presentation is simple and includes frequent summaries. Philosophy must take its starting point from the world of experience and must satisfy any description of that world. The world of sense perception and also its more elaborate structure, scientific knowledge, necessitate for their explanation the constructive activity of the mind plus an independent source of stimulation. The argument which supports this conclusion is essentially that of the Kantian philosophy. Thus space, time, and the other factors involved in the existence of the physical object, not being discovered in that object, are ascribed to the activity of the mind. The world of scientific description is ultimately reduced to process which can only

be postulated in conjunction with permanence and therefore involves the agency of mind. But the mind alone can not be responsible for the world of experience. The fact of control logically demands the existence of an external entity, the source of stimulation. Both modern realism and absolute idealism agree in positing an independent existence, but these doctrines are inadequate in their characterizations of this object. Realism errs in identifying the independent existence with the physical object. The idealistic absolute maintains that reality is experience, but not the experience of any particular individual. Only the recognition of the objective world as the joint product of the self and source of stimulation, which ultimately proves to be a supreme self, can correct these inadequacies.

When, then, it is queried, why has not this conception of the self as an essential coöperator in the construction of the world been more generally accepted, we are told that the explanation is to be sought in the "objectivity prejudice" due to the emphasis upon the achievements of science. But scientific procedure, with its mechanistic postulate, can not be accepted as the final word in the account. A more profound insight proves the ultimate reality to be the product of a creative self.

From this basis, proceeding to what is viewed as the more strictly philosophical portion of the inquiry, and the objective of the investigation, the world as value, the argument advances to the position that the world is ultimately value-content. The world of physical things is what the external stimulations mean to the mind. "They exist only because the mind attends, becomes interested, evaluates." The reality of the world system is "a practical element read into the thought structure." The four universes of value, corresponding to the four interests of the self, the cognitive, the esthetic, the moral, the religious, are discussed at length. A principle of organization of the whole world of values is discovered in the ideal of self-realization. The need for a belief in the persistence of our ideals gives rise to the religious values.

In connection with this discussion of values it may be remarked that one could accept much of the concrete material as in accord with present-day social ideals, without assenting to the logic upon which they are grounded. Values are discovered as needs of the self; in other words, they are ideals. Then these ideals acquire in a manner we fail to comprehend, the additional characteristics of reality, or independent existence. As such they possess a sanction which was not only not involved in their original nature, but implicates a quality directly opposed to it.

Under special problems of self-hood we may note an instance of

the logic which the arguments seem compelled to adopt in order to harmonize concrete experiences with the fundamental premises concerning the self. The mind and body are profoundly related, it is affirmed. "The self can give effective expression to the inner life of agency only through the body." On the other hand, "The self is only limited externally, there is no limitation from within." "We never experience self-weariness, what seems to be such is traceable to bodily functions." That is, our apprehension of the nature of the self is a matter of direct, immediate experience. But when a particular quality of this experience is judged to be of a negative value, it is disposed of by being assigned to the status of a causal condition, and thus relegated to the world of appearance.

In conclusion it may be remarked that this work contains no reference to that present-day philosophy which would accept the concepts of the self and the objective world as exhibiting a level of interpretation which is the outcome of an analysis of a more primitive neutral datum. Perhaps this omission may be explained as due to the attitude that such a doctrine, not purporting to be a theory of independent reality, is not to be estimated as falling within the province of philosophy.

SAVILLA ALICE ELKUS.

NEW YORK CITY.

JOURNALS AND NEW BOOKS

SCIENTIA. Vol. XLI, N. CLXXXII-6. Le invenzioni di Leonardo da Vinci. Parte II[a]—Arte militare—Meccanica pratica: *R. Marcolongo.* The Evolution of the Human Species: *R. Briffault.* Staat und Religion im alten Griechenland: *M. P. Nilsson.* La crise de cherté de la vie et ses répercussions sociales: *Et. Martin Saint-Léon.*

BRITISH JOURNAL OF PSYCHOLOGY. Vol. XVII, Part 4. An Experiment for the Testing of the Hypothesis of Larmarck: *William McDougall.* The Creative Process in the Artist's Mind: *S. Alexander.* Material versus Abstract Factors in Correlation: *C. Spearman.* A Group Factor in Sensory-Motor Tests: *Eric Farmer.* Parallelism in Curves of Motor Performance: *Eric Farmer.* The Relation between Intelligence and Social Status among Orphan Children: *D. C. Jones* and *A. M. Carr-Saunders.* Critical Notice of *The Measurement of Intelligence* by Professor E. L. Thorndike and Staff: *C. Spearman.* Critical Notice of *Psychology and Ethnology* by Dr. W. H. R. Rivers: *B. Z. Seligman.*

ANNALEN DER PHILOSOPHIE. Band VI, Heft 1. Die schöpferische Ereinheitlichung: *J. K. von Hoesslin.* Ein Verhältnis zwischen

Arithmetik, Geometrie und Physik: *S. Škreb.* Die Hypothesen der Metaphysik sind biologisch gegründet: *Martin Loesche.* Ist die Arithmetik ein logisch korrektes Lehrgebäude.—I: *Wilhelm Koppelmann.*

PHILOSOPHISCHER WELTANZEIGER. Numbers I and 2, eight pages each. (Edited by Paul Feldkeller, Schönwalde bei Berlin.) A new departure in the form of an illustrated bi-monthly digest of philosophical news (congresses, etc.). The first number (Nov.–Dec. 1926) contains an account of the Eighth International Congress of Psychology at Groningen, some comments on Dutch publications, and some pictures of Spinoza's birthplace. The second number (Jan.–Feb. 1927) reports the Sixth International Congress of Philosophy at Harvard, the Fourth Congress of the International Union for the Philosophy of Law and Economics, and the interesting work of Albert Schweitzer in Africa.

Brightman, Edgar Sheffield, Editor: Proceedings of the Sixth International Congress of Philosophy, Harvard University, Cambridge, Massachusetts, United States of America, September 13, 14, 15, 16, 17, 1926. New York and London: Longman's, Green & Co. 1927. lxxxvii + 716 pp.

Diès, A.: Autour de Platon. Essais de Critique et d'Histoire. Tome I: Les Voisinages—Socrate. Tome II: Esquisses doctrinales. (Bibliothèque des Archives de Philosophie.) Paris: Gabriel Beauchesne. 1927. xvi + 615 pp. 40 fr.

Seillière, Ernest: Morales et Religions Nouvelles en Allemagne. Le Néoromantisme au delà du Phin. Paris: Payot. 1927. 313 pp. 25 frs.

Kant, Immanuel: Erste Einleitung in die Kritik der Urteilskraft. Nach der Handschrift herausgegeben und mit Einführung und Anmerkungen versehen von Gerhard Lehmann. (Der Philosophischen Bibliothek Band 39b.) Leipzig: Felix Meiner. 1927. viii + 83 pp. 2.50 R.M. (First publication of the complete text of Kant's popular introduction to his *Critique of Judgment.*)

NOTES AND NEWS

In January of this year appeared the first number of a new quarterly entitled *"Hommes." Revue de Philosophie et d'Esthétique,* under the direction of Willem Van Ryswick, and published at Etichove, Belgium. The review contains the following foreword: *"La Revue de Philosophie et d'Esthétique* ne prétend pas défendre une doctrine déterminée. Elle est ouverte à toutes les idées intéressantes et originales. L'absence de revue du même genre en Bel-

gique justifie son existence. Elle se propose de répandre dans les milieux intellectuels l'œuvre des philosophes et des esthètes étrangers de renom. Il est inadmissible que des hommes de l'importance d'un Russell ou d'un Schiller en Angleterre, d'un Santayana ou d'un Royce en Amérique et sur le continent d'un Croce ou d'un Vaihinger, restent totalement inconnus ou jouissent simplement d'une renommée verbale. Il ne serait pas moins deplorable que des mouvements d'idées neufs et vigoureux, telle la phénoménological allemande contemporaine ou l'école de *l'Esprit* en France, ne soient connus que lorsque toute vitalité leur a échappé et qu'ils sont réduits à l'état de document historique. La pensée, la science et l'action ne peuvent progresser efficacement que si elles vivent en communion quotidienne avec le monde entier. Aussi la *Revue de Philosophie et d'Esthétique* compte-t-elle puiser aux sources les plus diverses, heureuse si par cette collaboration internationale, elle peut aider au progrès de la science."

Communications for the editor should be addressed to Willem Van Ryswyck, Etichove (lez Audenarde,) Belgique. Subscriptions should be sent to Jan Milo, 112 rue des Paquerettes, Schaerbeek, Brussels.

The contents of the first number are as follows: La science est-elle superstitieuse?: *Bertrand Russell.* L'esthétique de Kant—une appréciation: *DeWitt H. Parker.* Science, art et philosophie: *Willem Van Ryswyck.* La Prière—Quelques idées de psychologie religieuse: *Pierre de Briey.* L'inspiration et la composition: *Paul Fiernes.* Notes sur la goût: *Jean Vinchon.*

On June 11 was published the *Proceedings of the Sixth International Congress of Philosophy,* which contains all the papers read before the Congress held at Harvard University, September 13–17, 1926, together with its documents, minutes, and list of members. Copies have been sent to the active members. Associate members are entitled to purchase one copy in paper binding at the special price of $3.00. The price of the volume in cloth binding is $6.00 and in paper binding is $5.00. Orders should be sent to the publishers, Longmans, Green & Co., 55 Fifth Avenue, New York City, or 39 Paternoster Row, London.

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There is no similar journal in the field of scientific philosophy. It is issued fortnightly and permits the quick publication of short contributions, prompt reviews, and timely discussions. The contents of the last six issues are as follows:

Volume XXIV. No. 7. March 31, 1927.

Categorial Analysis and Pragmatic Realism. SIDNEY HOOK.

Book Reviews. Journals and New Books. Notes and News.

Volume XXIV. No. 8. April 14, 1927.

Reason and Faith. WILLIAM JAMES.

Notes toward the Completion of a Bibliography of the Writings of William James. EMMANUEL LEROUX.

Book Reviews. Journals and New Books. Notes and News.

Volume XXIV. No. 9. April 28, 1927.

Our Knowledge of Other Minds. W. W. SPENCER.

What is the Correct Interpretation of Critical Realism? ROY WOOD SELLARS.

Book Reviews. Journals and New Books. Notes and News.

Volume XXIV. No. 10. May 12, 1927.

The Concept of the Symbol (I). CHARLES W. MORRIS.

The Short-Circuiting of Conscious Responses. KNIGHT DUNLAP.

Book Reviews. Journals and New Books. Notes and News.

Volume XXIV. No. 11. May 26, 1927.

The Concept of the Symbol (II). CHARLES W. MORRIS.

The Twenty-eighth Annual Meeting of the Western Division of the American Philosophical Association. A. CORNELIUS BENJAMIN.

Book Reviews. Journals and New Books. Notes and News.

Volume XXIV. No. 12. June 9, 1927.

Also the Emergence of Matter. ALFRED H. LLOYD.

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Quarterly. Child behavior, differential and genetic psychology. Founded

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Bi-monthly from January 1926. Each number one complete research. Child behavior, differential and genetic psychology. Founded 1925.

Psychological Review.—Princeton, N. J.; Psychological Review Company.
Subscription $5.00. 480 pages annually.
Bi-monthly. General. Founded 1894. Edited by Howard C. Warren and John B. Watson.

Psychological Bulletin.—Princeton, N. J.; Psychological Review Company.
Subscription $5.50. 720 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Samuel W. Fernberger.

Psychological Monographs.—Princeton, N. J.; Psychological Review Company.
Subscription $6.00 per volume. 500 pages. Founded 1895. Edited by Shepherd I. Franz.
Published without fixed dates, each issue one or more researches.

Psychological Index.—Princeton, N. J.; Psychological Review Company.
Subscription $2.00. 200 pages. Founded 1895. Edited by W. S. Hunter.
An annual bibliography of pyschology literature.

Archives of Psychology.—Sub-Station 84, New York; Archives of Psychology.
Subscription $5.00. 500 pages per volume. Founded 1906. Edited by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology and Social Psychology.—Albany, N. Y.
Subscription $5.00. Boyd Printing and Publishing Co. Edited by Morton Prince in co-operation with Floyd H. Allport.
Quarterly. 432 pages annually. Founded 1906. Abnormal and social.

Psychological Clinic.—Philadelphia; Psychological Clinic Press. [1907.
Subscription $2.50. 288 pages. Edited by Lightner Witmer. Founded
Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Training School Bulletin.—Vineland, N. J.; The Training School.
Subscription $1.00. 160 pages annually. Edited by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Comparative Psychology Monographs.—Baltimore; Williams & Wilkins Co.
Subscription $5.00. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review.—Washington, D. C.; 3617 Tenth Street, N. W.
Subscription $6.00. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Edited by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology.—Princeton, N. J.
Psychological Review Company. 480 pages annually. Experimental.
Subscription $5.00. Founded 1916. Bi-monthly. Edited by Madison Bentley.

Journal of Applied Psychology.—Worcester, Mass.; Florence Chandler.
Subscription $5.00. 400 pages annually. Founded 1917.
Quarterly. Edited by James P. Porter and William F. Book.

Journal of Comparative Psychology.—Baltimore; Williams & Wilkins Co.
Subscription $5.00. 500 pages annually. Founded 1921.
Bi-monthly. Edited by Knight Dunlap and Robert M. Yerkes. J.P.

Psychological Abstracts.—Princeton, N. J.
Subscription $6.00. 600 pages annually. Edited by W. S. Hunter.
Monthly. Abstracts of psychological literature. Founded 1927.